

# Multifunctional Metal Matrix Composite Filament Wound Tank Liners, Phase I

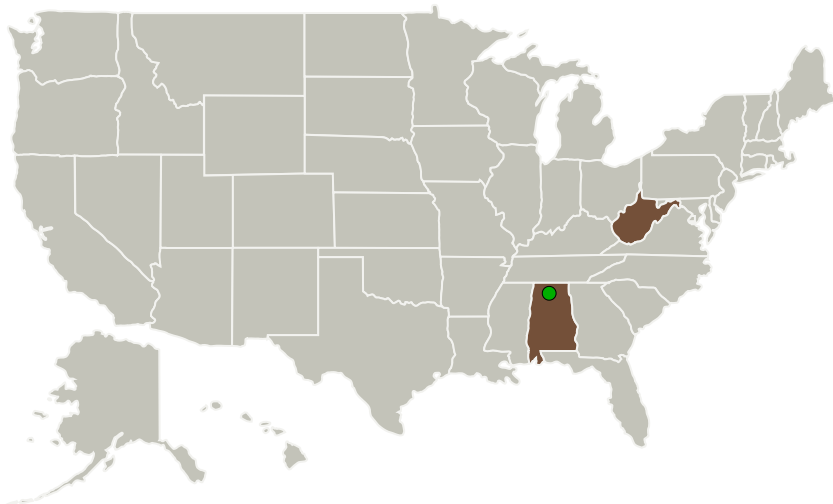
Completed Technology Project (2010 - 2010)



## Project Introduction

Metal Matrix Composite (MMC) materials offer tremendous potential for lightweight propellant and pressurant tankage for space applications. Thin MMC liners for COPVs would have enough strength to withstand tensile loading at maximum expected operating pressure (MEOP) and compressive loading at zero pressure without buckling. Thus, performance benefits would be expected when compared to aluminum, titanium, and stainless steel liners. Touchstone proposes to team with Carleton Technologies Pressure Vessel Division (part of the Cobham Life Support Division, Westminster, MD) to extend current MMC technology into the area of lightweight, multifunctional pressure vessels that can minimize propulsion system mass growth and achieve the efficiencies that will make future propulsion systems viable. The development of improved cryotanks can easily be extended to programs within the Departments of Defense and to private industry. The successful completion of the proposed work will expedite the implementation of this enabling technology into aerospace, military, and commercial applications.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Touchstone Research Laboratory, Ltd.	Lead Organization	Industry	Triadelphia, West Virginia
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	West Virginia

## Project Transitions

**January 2010:** Project Start

**July 2010:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140102>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Touchstone Research Laboratory, Ltd.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Brian L Gordon

### Co-Investigator:

Brian S Gordon

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## Technology Maturity (TRL)

Start: **2**  
Current: **4**  
Estimated End: **4**



## Technology Areas

### Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.4 Manufacturing
    - └ TX12.4.4 Sustainable Manufacturing

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System